Deltas Working Group

Introduction to WG activities:

No change since previous report.

Past activities:

The Delta Working Group has undertaken several significant initiatives to enhance the understanding of deltaic geomorphology in recent months. A major milestone was the successful organization of a special session proposal for the 11th IAG International Conference on Geomorphology. In an online meeting, members including Prof. Alfred Vespremeanu-Stroe (Romania), Prof. Jose Maria Landim Dominguez (Brazil), and Thais Baptista da Rocha (Brazil) discussed and finalized the session titled "Delta Geomorphology Observed from the Past to the Present: Interactions of Natural Processes and Anthropogenic Influences". The session aims to explore how natural forces and human activities shape river deltas, emphasizing their response to sea-level rise, sediment changes, and climate impacts. It encourages the use of innovative methodologies such as numerical modeling, machine learning, and chronostratigraphy.

In the field, the group was associated with several research trips across Brazil and India.
In April and August 2024, a research team investigated the Jequitinhonha/Pardo Delta, a wave-dominated system on Brazil's eastern coast. Here, GPR (Ground Penetrating Radar) lines and OSL (Optically Stimulated Luminescence) samples were collected to understand its coastal evolution. In July 2024, a similar effort was undertaken at the Paraíba do Sul Delta, known for its asymmetrical, strandplain features. The team examined beach ridge formations and coastal erosion, linking modern morphodynamics with Holocene changes through detailed field data collection. Finally, in December 2024, the Parnaíba Delta was explored, which is distinct for its mangrove plains and transgressive dune fields. GPR, OSL, and radiocarbon sampling were carried out to reconstruct its Holocene development.
In India, fieldworks were conducted in the Eastern Subarnarekha Coastal Region and the Indian part of the Ganga-Brahmaputra-Meghna (GBM) Delta. Sediment samples were collected for grain size analysis, heavy mineral study, and OSL dating in the chenier ridges of Eastern Subarnarekha coastal region (April and November, 2024). Elevations were recorded using Total Station and DGPS to understand lithological variability and depositional history. In the mature part of the GBM Delta, changes in accretion topography have studied along the Bhagirathi-Hugli, which is the largest distributary of the Ganga River. A number of field-based studies were conducted to assess the stability of mid-channel bars (April 2024-March 2025). In the Sundarban, which is the largest mangrove forest in the world, water samples were taken at varying depths to assess suspended sediment concentration in different seasons (April–September 2024). Vertical accretion was measured along the tidal estuaries to evaluate sedimentation trends and delta resilience. Besides, in the Mature-Moribund GBM Delta, GPR surveys and borehole drilling were carried out to investigate subsurface features and extract sediment cores (June–December 2024). This revealed paleo-channel structures and supported reconstruction of the delta's transition to a moribund state.

These studies enhance understanding of deltaic processes, stratigraphy, and environmental change. These collaborative efforts reflect a multidisciplinary and global approach to studying and managing deltaic landscapes under growing environmental pressure.

Forthcoming activities:

- Organizing a session in the 11th IAG International Conference in New Zealand (2026).
- Organization of fieldworks and webinars in the focus regions.
- Conducting at an online workshop within December 2025.
- The working group aims to bring out a special issue on delta, following the 11th IAG International Conference in New Zealand.
- Regular meetings will be organized with the present stakeholders and other working groups to discuss possible collaborations.